

CLAIMS

We claim:

1. An electrical resistor, particularly a temperature-dependent measuring resistance with low mass and thereby rapid response time, comprising an electrical conductor path (4) having at least two connection contact pads (7, 8) and arranged on an electrically insulating surface of a substrate (1), wherein the substrate (1) has at least one recess (6) therein and a portion of the conductor path (4) spans the at least one recess (6) in a bridge-like manner, the conductor path (4) being arranged in a plane, wherein the substrate (1) is made of metal and is provided with an applied insulation layer as a membrane (3), and wherein the conductor path (4) is arranged on the membrane (3).

2. The electrical resistor according to claim 1, wherein the conductor path (4) is selectively covered by a passivation layer (5) up to the connection contact pads (7, 8).

3. The electrical resistor according to claim 1, wherein the substrate (1) has a thickness of about 0.15 mm to 0.6 mm.

4. The electrical resistor according to claim 3, wherein the thickness is about 0.2 to 0.25.

5. The electrical resistor according to claim 1, wherein the metal comprises an iron-nickel alloy.

6. The electrical resistor according to claim 5, wherein the alloy comprises FeNi42 (alloy 42).

7. The electrical resistor according to claim 1, wherein the metal comprises an iron-nickel-cobalt alloy.

8. The electrical resistor according to claim 7, wherein the alloy comprises FeNi28Co18 (VACON 10).

9. The electrical resistor according to claim 1, wherein the metal comprises steel 1.4767 (FeCr20Al5).

10. The electrical resistor according to claim 1, wherein the metal comprises steel 1.4541.

11. The electrical resistor according to claim 1, wherein the metal comprises steel 1.4571.

12. The electrical resistor according to claim 1, wherein the metal comprises nickel.

13. The electrical resistor according to claim 1, wherein the electrical conductor path is applied on a plate-shaped membrane at least partially covering the recess, wherein the membrane comprises a material selected from the group consisting of SiO, MgO, ZrO, Si₃N₄, TiO₂, Al₂O₃, and mixed oxides thereof, and the membrane has a thickness of about 0.5 to 10 μm.

14. The electrical resistor according to claim 13, wherein the thickness is about 2 to 2.5 μm.

15. The electrical resistor according to claim 13, wherein the membrane is constructed sandwich-like from a combination of the materials.

16. The electrical resistor according to claim 1, wherein the conductor path (4) comprises a platinum layer having a thickness of about 0.1 to 6 μm.

17. The electrical resistor according to claim 16, wherein the thickness is about 0.3 to 0.6 μm.

18. The electrical resistor according to claim 1, wherein the passivation layer (5) comprises an SiO layer or an Al₂O₃ layer having a thickness of about 0.3 μm to 10 μm.

19. The electrical resistor according to claim 1, further comprising an etching stop layer (2) applied to the metal substrate, wherein the etching stop layer (2) has a thickness of about 0.1 to 6 μm.

20. The electrical resistor according to claim 19, wherein the thickness is about 2.5 to 3 μm .

21. The electrical resistor according to claim 19, wherein the etching stop layer (2) comprises a material selected from the group consisting of Ti, Pt, Ni and combinations thereof.

22. The electrical resistor according to claim 19, wherein the etching stop layer (2), membrane (3) and passivation layer (5) are applied to the metal substrate by PVD or CVD processes.

23. A process for manufacturing an electrical resistor, particularly a temperature-dependent measuring resistance with low mass, having an electrical conductor path with at least two connection contact pads arranged on an electrically insulating surface of a rectangular prism-shaped metal substrate, wherein a portion of the conductor path spans at least one recess of the substrate in a bridge-like manner and the conductor path is arranged in a plane, the process comprising providing the substrate on its front side with a metal etching stop layer, providing the substrate on its reverse side with a photolithographic enamel structuring, and conducting a wet chemical free etching from the reverse side of the substrate up to the previously applied metal etching stop.

24. The process according to claim 23, wherein the wet chemical free etching from the reverse side of the metal substrate up to a metal etching stop imparts a low thermal mass to the resistor.

25. The process according to claim 24, wherein the free etching comprises spray etching with an FeCl_3 solution.